1967

Near point refraction

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Abstract

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NEAR POINT REFRACTION

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EQUIPMENT USED IN FILM

1. Camera: Bolex 16 mm.
2. Light: a. source: stage lights supplied by drama department
   b. foot-candles: varied from 60 to 150 ft.c.
3. Film: Kodak Tri-X ASA 200 and Dupont high speed ASA 160
4. Bausch and Lomb refractor unit

THE PROBLEM: The purpose of this study is to produce a film which shows the clinician a near-point subjective routine designed by Professor Harold M. Haynes.

INTRODUCTION: This routine may be used for children as young as 3 1/2 to 4 years of age. By five years of age it is expected that a routine analytical examination can be used. Rather than show a complete examination, this film shows a near-point examination to measure the magnitude of anisometropia, axis of astigmatism, the punctum remotum of the accommodative system and several selected accommodative tests.

HOW TO USE THE FILM

In order for the clinician to get best results from the film he should read and study the outline prior to viewing the film and have it available during and after the film. It would be preferable for the instructor to narrate the film.

SURVEY RETINOSCOPY

A near-point survey retinoscopy is performed at fifteen to twenty inches. This is done with no lenses in place and may be performed with the child seated behind a refractor, using a trial frame, or not using the refractor or trial frame. The purpose of this survey is for the examiner to estimate the sphere, cylinder, axis and aniso of the patient. This survey is done with the patient fixating a card afixed on the examiner's retinoscope. The card has different pictures of animals on it. In the case of strabismics an occluder is used. The examiner asks the patient to name and to answer questions about the animals in order to hold the child's attention. If the examiner observes a marked astigmatic movement (greater than one diopter) in the reflex, he would stop the retinoscopy and take a number two or keratometer finding before proceeding.

MONOCULAR HIGH NEUTRAL

A monocular high neutral retinoscopy is now performed on each eye. This is performed at thirteen to twenty inches. The target is a card on the retinoscope with small letters, numbers or pictures on it depending on the age of the patient. The examiner alternates repidly from one eye to the other while adding plus to obtain a neutral reflex. The alternation is done for aniso after cylinder and sphere have been determined by monocular testing. The examiner adds minus cylinder to correct for the cylindrical component of the reflex. Since this is a monocular high neutral retinoscopy, the examiner adds plus until the reflex shows neutral or slight against motion. The examiner moves out and then in concomitantly with questioning to get the accommodative posture to move to its distal end point. The lens power and distance between the test card and the subject's eyes are recorded.

MONOCULAR PLUS TO BLUR OUT AND RECOVERY

To start the subjective refraction the examiner reduces the high-neutral monocular sphere by .50 to 1.00 diopter. The examiner now proceeds to do a monocular plus to blur out and recovery, or number 21 monocular.

If the child is less than six years old and doesn't know the names of letters or numbers, the following routine is used: With .50 to 1.00 diopter below the high-neutral monocular sphere the child is asked, "Can you see each of the tiny little letters?" (20/20) (Examiner points to the line). A plus 2.00 diopter sphere is then interposed (the retinoscopic working distance lens) and the child is again asked, "Can you see each of the tiny little letters?" The examiner may put in the plus 2.00 diopter lens and remove it several times in order to make sure the child can discriminate between discernably clear forms and blurred out spots. If this differential response cannot be made, the subjective refraction for sphere is terminated.

If the child is old enough to read, he is asked to read the letters in the 20/20 line or smallest readable line. (The examiner has the option of adding plus 2.00 at this point.) The examiner adds plus and asks the patient, "Tell me when you cannot read even one letter in the bottom line." When the patient reports that he cannot read even one letter,

the examiner then records this as the blur-out. .50 to .75 D. is added at the blur out and then plus is reduced instructing the patient to say "now" when each of the letters is readable. He then occludes that eye and displays the chart to the other eye. When the patient again reports that he cannot read even one letter, and the recovery lens is in place, the examiner occludes that eye and displays the chart to the other eye again. The examiner alternates from right eye, left, right eye until he is satisfied that the maximum plus for blur out and recovery ranges have been found. The blur-out point is most frequently .50 to .75 diopter above the high neutral monocular sphere. The blur-out finding minus 3.25 diopters is a tentative far-point sphere. The blur-out and recovery are used to calculate the probable distance refraction (7a) and the magnitude of anisometropia.

NEAR CYLINDER (POWER DETERMINATION)

The near-point astigmatic test for axis and power follows the #21 monocular test. One eye is occluded. If the cylinder axis found with retinoscopy is approximately 90 or 180, the examiner displays the cross-cylinder card with lines running horizontally and vertically at sixteen inches. The examiner then puts in the cross-cylinders with red dots vertical so that the vertical lines are expected to appear blackest. The examiner asks the patient which lines are blackest and most distinct.

If the patient cannot respond verbally, he is given pointers with which to point to the darker lines. The examiner then flips the cross-cylinders so that the red dots are horizontal and has the patient point to the blackest lines again. This procedure is to establish if the child is capable of making these discriminations. If the child sees no difference when the examiner flips the cross-cylinder, the child may not be able to make these discriminations, or the retinoscopic cylinder finding is very inaccurate, or the cross-cylinder dioptric power is insufficient. If, after flipping the cross-cylinder the examiner finds that the child does not point to the opposite lines, the examiner should change the cylinder power until the child does point to the opposite set of lines. If the cylinder change is significant, the examiner may recheck the #21 monocular with the near-cylinder in place to better estimate the distance subjective finding.

NEAR CYLINDER (AXIS DETERMINATION)

The axis is determined by using the straddle technique with the 45 degree off-axis cross cylinder. The cross-cylinders are not used and are not in place. The examiner changes the cylinder axis 15 to 20 degrees from the retinoscopy axis before starting. The examiner now has the option of asking any of the following questions. (a) If the child is less than six years, the examiner may hand the child a pointer and ask the child to point to the blackest lines. (b) If the child is over six years, the examiner may ask the child which lines are blackest or most distinct, the ones pointing up and to the right or the ones pointing up and to the left, or he may have the child use a pointer. If the child points to the lines towards the left as being darker, the examiner occludes the eye with one hand and turns the axis dial approximately 15 to 20 degrees with the other hand. He turns the axis dial so that the axis corresponds more with the lines up and towards the left. The examiner lets the patient see the target again and then asks the patient to point to the darker lines again. If the patient now points to the lines towards the left as being darker, the examiner again covers the eye with one hand and with his other hand turns the axis dial approximately 10 to 15 degrees so that the axis corresponds more with the lines towards the right. The examiner continues until he can find the place which is the mid-point of the reversing points.

MONOCULAR CROSS CYLINDER (14A)

After the near-point subjective cylinder test the examiner is now ready to do a monocular cross-cylinder test (#14a) for measuring anisometropia and accommodative posture. The test is begun with the same lenses in place from the last test and with the same cross-cylinder target. The cross-cylinders are used here and are put in place with the red dots at 135 degrees. He occludes one eye and asks the patient which lines are blackest and most distinct. The patient should point to the darker lines up and to the right if the red dots of the cross-cylinder are up and to the right. The examiner occludes that eye and exposes the patient's other eye. The patient points to the darker lines which should be the lines towards the examiner. The examiner alternately occludes the patient's eye which reducing plus until the patient points or says that the lines towards the left are darker.

An alternate method of performing this procedure is to actually reduce plus to the reversal point in each eye and then alternate. The refractor can be used to alternately occlude and change lenses.

NEAR PHORIA (#15A)

The examiner now does a near phoria (#15A). He removes the cross-cylinder and puts the Risley prisms in place. He uses the reduced Snellen card as a target. He performs the test in the usual manner.

BINOCULAR CROSS CYLINDER (#14B)

The examiner now performs a binocular cross-cylinder test (#14B). The cross-cylinders and the 45 degree off axis cross cylinder target are used again. This test is performed in the usual manner, with one exception--bright illumination is used.

CLOSING STATEMENT

This film has shown you a near refractive technique. Since it is easier to hold the child's attention at near than at far, this routine is a valuable alternate when examing children. Adults too may be examined with this technique, especially with the near-cylinder tests. Other tests should complement this routine. With this routine and additional tests the clinician should have an adequate set of findings to properly analyze the child's visual behavior and status.